

B. Amendment to the Claims

Please cancel claims 6, 7, 32, 33 and 51-56 without prejudice or disclaimer.

Please amend claims 1, 12, 25-27 and 38 as follows. A complete listing of the claims pending in this application is provided.

1. (Currently Amended) A method of manufacturing an electron beam apparatus having an airtight container with electron-emitting devices contained therein and spacers provided in said airtight container, comprising a coating step of providing a film on a spacer substrate to be said spacers, said coating step comprising an applying step of applying a liquid film material by emitting, according to an ink-jet method, from an emitting portion in a predetermined direction to a boundary portion between two planes of said spacer substrate, said boundary portion having a curvature radius not smaller than 1/100 of a maximum thickness of a portion of said spacer substrate on which said film is provided.

2. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 1, comprising the moving step of changing the relative position of said emitting portion and said spacer substrate.

3. (Previously Presented) A method of manufacturing an electron beam apparatus as claimed in claim 1 or 2, wherein said applying step comprises the step of emitting said liquid film material drop by drop from said emitting portion.

4. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 1, wherein said applying step is the step of emitting said liquid film material from said emitting portion by generating a bubble in said liquid film material before emission.

5. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 1, wherein said applying step is the step of emitting said liquid film material from said emitting portion by a piezoelectric device.

6-7. (Cancelled)

8. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 1, further comprising the film forming step of forming said film from said applied film material.

9. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 1, wherein said liquid film material contains at least a metal element.

10. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 1, wherein said film is an electrode.

11. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 1, wherein said applying step is carried out using a plurality of said emitting portions.

12. (Currently Amended) A method of manufacturing an electron beam apparatus having an airtight container with electron-emitting devices contained therein and spacers provided in said airtight container, comprising a coating step of providing a film on a spacer substrate to be said spacers, said coating step comprising an applying step of applying a liquid film material by emitting, according to an ink-jet method, from an emitting portion in a predetermined direction to a boundary portion between two planes of said spacer substrate, said boundary portion being pretreated in advance so that there is no substantially acute angle in a section at said boundary portion.

13. (Previously Presented) A method of manufacturing an electron beam apparatus as claimed in claim 1, wherein said applying step is carried out using a plurality of emitting portions each of which emits said liquid film material drop by drop.

14. (Previously Presented) A method of manufacturing an electron beam apparatus as claimed in claim 12, wherein said two planes are a bottom plane and a side plane of said spacer substrate.

15. (Cancelled)

16. (Previously Presented) A method of manufacturing an electron beam apparatus as claimed in claim 12, wherein said pretreatment of said spacer substrate is rounding or tapering said boundary portion.

17. (Previously Presented) A method of manufacturing an electron beam apparatus as claimed in claim 12, wherein said pretreatment of said spacer substrate is carried out such that the following relationship is satisfied:

$$(t^2 + 4h^2) < s^2 < (t+2h)^2$$

wherein t is the maximum value of the thickness of said spacer substrate where said film is formed, h is the height of said film, and s is the inner peripheral length of a section of said film.

18. (Previously Presented) A method of manufacturing an electron beam apparatus as claimed in claim 16, wherein said rounding of said spacer substrate is carried out such that the radius r of curvature is 1% or more of the maximum value t of the thickness of said spacer substrate where said film is formed.

19. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 16, wherein said tapering of said spacer substrate is carried out by grinding.

20. (Previously Presented) A method of manufacturing an electron beam apparatus as claimed in claim 1 or 12, wherein said spacer substrate is processed using hot-draw, which is carried out with the relationship $S_2 > S_1$ being satisfied, where S_1 is a cross-section of the desired spacer substrate and S_2 is a cross-section of a spacer base material, with both ends of said spacer base material being fixed, the cross-section of said spacer base material being similar in shape to that of said spacer substrate, a part of said spacer base material in the longitudinal direction being heated to a temperature at or above the softening point while one end portion is fed in the direction of the heated portion at a velocity of V_1 and the other end portion is drawn in the same direction as that of V_1 at a velocity of V_2 , and the relationship $S_1 / S_2 = V_1 / V_2$ being satisfied, and

wherein said spacer base material is cooled after said hot-draw and said drawn spacer base material is cut to have the desired length.

21. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 1 or 12, wherein said spacer substrate is formed of glass or ceramic.

22. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 1 or 12, wherein a high resistance film is further formed on said spacers having said film formed thereon.

23. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 22, wherein said high resistance film has the surface resistance value of $10^5 [\Omega/\square]$ to $10^{12} [\Omega/\square]$.

24. (Original) A method of manufacturing an electron beam apparatus as claimed in claim 23, wherein the surface resistance value of said film is 1/10 or less of that of said high resistance film and is 10^7 [Ω/\square] or less.

25. (Currently Amended) A method of manufacturing an electron beam apparatus having an airtight container with electron-emitting devices contained therein and minute members provided in said airtight container, comprising a coating step of providing a film on a minute substrate to be said minute members, said coating step comprising an applying step of applying a liquid film material by emitting, according to an ink-jet method, from an emitting portion in a predetermined direction to a boundary portion between two planes of said minute substrate, said boundary portion having a curvature radius not smaller than 1/100 of a maximum thickness of a portion of said minute substrate on which said film is provided.

26. (Currently Amended) A method of manufacturing an electron beam apparatus having an airtight container with electron-emitting devices contained therein and minute members provided in said airtight container, comprising a coating step of providing a film on a minute substrate to be said minute members, said coating step comprising an applying step of applying a liquid film material by emitting, according to an ink-jet method, from an emitting portion in a predetermined direction to a boundary portion between two planes of said minute substrate, said boundary portion being pretreated in advance so that there is no substantially acute angle in a section at said boundary portion.

27. (Currently Amended) A method of manufacturing spacers for use in an electron beam apparatus having an airtight container with electron-emitting devices contained therein and said spacers provided in said airtight container, comprising a coating step of providing a film on a spacer substrate to be said spacers, said coating step comprising an applying step of applying a liquid film material by emitting, according to an ink-jet method, from an emitting portion in a predetermined direction to a boundary portion between two planes of said spacer substrate, said boundary portion having a curvature radius not smaller than 1/100 of a maximum thickness of a portion of said spacer substrate on which said film is provided.

28. (Original) A method of manufacturing spacers as claimed in claim 27, comprising the moving step of changing the relative position of said emitting portion and said spacer substrate.

29. (Previously Presented) A method of manufacturing spacers as claimed in claim 27 or 28, wherein said applying step comprises the step of emitting said liquid film material drop by drop from said emitting portion.

30. (Original) A method of manufacturing spacers as claimed in claim 27, wherein said applying step is the step of emitting said liquid film material from said emitting portion by generating a bubble in said liquid film material before emission.

31. (Original) A method of manufacturing spacers as claimed in claim 27, wherein said applying step is the step of emitting said liquid film material from said emitting portion by a piezoelectric device.

32-33. (Cancelled)

34. (Original) A method of manufacturing spacers as claimed in claim 27, further comprising the film forming step of forming said film from said applied film material.

35. (Original) A method of manufacturing spacers as claimed in claim 27, wherein said liquid film material contains at least a metal element.

36. (Original) A method of manufacturing spacers as claimed in claim 27, wherein said film is an electrode.

37. (Original) A method of manufacturing spacers as claimed in claim 27, wherein said applying step is carried out using a plurality of said emitting portions.

38. (Currently Amended) A method of manufacturing spacers, comprising a coating step of providing a film on a spacer substrate to be said spacers, said coating step comprising an applying step of applying a liquid film material by emitting,

according to an ink-jet method, from an emitting portion to a boundary portion between two planes of said spacer substrate, said boundary portion being pretreated in advance so that there is no substantially acute angle in a section at said boundary portion.

39. (Cancelled)

40. (Previously Presented) A method of manufacturing spacers as claimed in claim 38, wherein said two planes are a bottom plane and a side plane of said spacer substrate.

41. (Cancelled)

42. (Previously Presented) A method of manufacturing spacers as claimed in claim 38, wherein said pretreatment of said spacer substrate is rounding or tapering said boundary portion.

43. (Previously Presented) A method of manufacturing spacers as claimed in claim 38, wherein said pretreatment of said spacer substrate is carried out such that the following relationship is satisfied:

$$(t^2 + 4h^2) < s^2 < (t+2h)^2$$

wherein t is the maximum value of the thickness of said spacer substrate where said film is formed, h is the height of said film, and s is the inner peripheral length of a section of said film.

44. (Previously Presented) A method of manufacturing spacers as claimed in claim 42, wherein said rounding of said spacer substrate is carried out such that the radius r of curvature is 1% or more of the maximum value t of the thickness of said spacer substrate where said film is formed.

45. (Original) A method of manufacturing spacers as claimed in claim 42, wherein said tapering of said spacer substrate is carried out by grinding.

46. (Previously Presented) A method of manufacturing spacers as claimed in claim 27 or 38, wherein said spacer substrate is processed using hot-draw, which is carried out with the relationship $S_2 > S_1$ being satisfied, where S_1 is a cross-section of the desired spacer substrate and S_2 is a cross-section of a spacer base material, with both ends of said spacer base material being fixed, the cross-section of said spacer base material being similar in shape to that of said spacer substrate, a part of said spacer base material in the longitudinal direction being heated to a temperature at or above the softening point while one end portion is fed in the direction of the heated portion at a velocity of V_1 and the other end portion is drawn in the same direction as that of V_1 at a velocity of V_2 , and the relationship $S_1 / S_2 = V_1 / V_2$ being satisfied, and

wherein said spacer base material is cooled after said hot-draw and said drawn spacer base material is cut to have the desired length.

47. (Original) A method of manufacturing spacers as claimed in claim 27 or 38, wherein said spacer substrate is formed of glass or ceramic.

48. (Original) A method of manufacturing spacers as claimed in claim 27 or 38, wherein a high resistance film is further formed on said spacer having said film formed thereon.

49. (Original) A method of manufacturing spacers as claimed in claim 48, wherein said high resistance film has the surface resistance value of 10^5 [Ω/\square] to 10^{12} [Ω/\square].

50. (Original) A method of manufacturing spacers as claimed in claim 49, wherein the surface resistance value of said film is 1/10 or less of that of said high resistance film and is 10^7 [Ω/\square] or less.

51-56. (Cancelled)